CLAIMS:

1. A computer program product comprising a computer readable medium having thereon computer program code means, when said program is loaded, to make the computer execute, when supplied with at least tuning band and avoidance band data, a method of determining an appropriate intermediate frequency or intermediate frequency range for a radio frequency (r.f.) receiver in which a received modulated r.f. signal is mixed with a signal from a local oscillator at a different frequency to yield as one of the mixing products a signal at a desired intermediate frequency for subsequent processing, the method comprising the steps of:

a) determining a tuning band of radio frequencies which the receiver is desired to receive;

b) determining an avoidance band containing radio frequencies closed to external transmission and/or frequencies of sources of outside interference;

c) identifying a plurality of spurious mechanisms by which the receiver either receives or transmits spurious signals and determining the frequencies of the spurious signals in relation to the intermediate frequency; and

d) determining which intermediate frequencies result in spurious emissions to or responses from the avoidance band for any of the frequencies in the tuning band.

2. A computer program product as claimed in claim 1 in which step (d) includes determining, for each spurious mechanism, one or more hazard bands, being ranges of frequency of spurious emissions or responses each corresponding to the whole of the tuning band.

3. A computer program product as claimed in claim 1 in which the spurious mechanisms include one of the second images.

4. A computer program product as claimed in claim 1 in which the spurious mechanisms include both of the second images.

5. A computer program product as claimed in claim 1 in which the spurious mechanisms include one of the third images.

6. A computer program product as claimed in claim 1 in which the spurious mechanisms include both of the third images.

7. A computer program product as claimed in claim 1 in which the spurious mechanisms include the mixer sum product.

8. A computer program product comprising a computer readable medium having thereon computer program code means, when said program is loaded, to make the computer execute, when supplied with at least tuning band and avoidance band data, a method of determining an appropriate intermediate frequency or intermediate frequency range for a radio frequency transmitter in which a modulated signal at an intermediate frequency is mixed with a local oscillator waveform having a different frequency to yield as one of the mixing products a signal at a desired frequency for transmission, the method comprising:

a) determining a tuning band of frequencies which the transmitter is desired to transmit;

b) determining an avoidance band containing radio frequencies closed external transmission;

c) identifying a plurality of spurious mechanisms by which the transmitter transmits spurious signals and determining the relationship between the spurious signals and the intermediate frequency; and

d) determining which intermediate frequencies result in spurious emissions to the avoidance band for any of the frequencies in the tuning range.

9. A computer program product as claimed in claim 8 in which step (d) includes determining, for each spurious mechanism, one or more hazard bands being ranges of frequency of spurious emissions each corresponding to the whole of the tuned band.

10. A computer program product as claimed in claim 1 including the step of determining one or more additional avoidance bands and repeating step (d) for each additional avoidance band.

11 A computer program product as claimed in claim 1 in which the spurious mechanisms are ranked according to their significance and in which a range of available intermediate frequencies is divided in to sub-ranges each identified by the most significant spurious mechanism, if any, affecting the avoidance band(s) and resulting from the use of an intermediate frequency in that sub-range.

12. A computer program product as claimed in claim 1 in which the spurious mechanisms include the first image.

13. A computer program product as claimed in claim 1 in which the spurious mechanisms include local oscillator leakage.

14. A computer program product as claimed in claim 1 in which the spurious mechanisms include intermediate frequency leakage.

15. A computer program product as claimed in claim 1 in which the spurious mechanisms include the second harmonic of the local oscillator.

16. A computer program product as claimed in claim 1 in which the spurious mechanisms include the third-order reverse inter-modulation product of the local oscillator and any external source of interference in the tuning band.

17. A computer program product as claimed in claim 8 including the step of determining one or more additional avoidance bands and repeating step (d) for each additional avoidance band.

18. A computer program product as claimed in claim 8 in which the spurious mechanisms are ranked according to their significance and in which a range of available intermediate frequencies is divided in to sub-ranges each identified by the most significant spurious mechanism, if any, affecting the avoidance band(s) and resulting from the use of an intermediate frequency in that sub-range.

19. A computer program product as claimed in claim 8 in which the spurious mechanisms include the first image.

20. A computer program product as claimed in claim 8 in which the spurious mechanisms include local oscillator leakage.

21. A computer program product as claimed in claim 8 in which the spurious mechanisms include intermediate frequency leakage.

22. A computer program product as claimed in claim 8 in which the spurious mechanisms include the second harmonic of the local oscillator.

23. A computer program product as claimed in claim 8 in which the spurious mechanisms include the third-order reverse inter-modulation product of the local oscillator and any external source of interference in the tuning band.

24. Apparatus for determining an appropriate intermediate frequency or intermediate frequency range for a radio frequency (r.f.) receiver in which a received modulated r.f. signal is mixed with a signal from a local oscillator at a different frequency to yield as one of the mixing products a signal at a desired intermediate frequency for subsequent processing, the apparatus comprising:

a) means for receiving input data defining a tuning band of radio frequencies which the receiver is desired to receive;

b) means for receiving input data defining an avoidance band containing radio frequencies closed to external transmission and/or frequencies of sources of outside interference;

c) means for storing data relating to a plurality of spurious mechanisms by which the receiver either receives or transmits spurious signals and determining the frequencies of the spurious signals in relation to the intermediate frequency;

d) means for determining which intermediate frequencies result in spurious emissions to or responses from the avoidance band for any of the frequencies of the tuning band.

25. Apparatus as claimed in claim 24 in which said means (d) includes means for determining, for each spurious mechanism, one or more hazard bands, being ranges of frequency of spurious emissions or responses each corresponding to the whole of the tuning band.

26. Apparatus as claimed in claim 24 in which the spurious mechanisms include one of the second images.

27. Apparatus as claimed in claim 24 in which the spurious mechanisms include both of the second images.

28. Apparatus as claimed in any of claim 24 in which the spurious mechanisms include one of the third images.

29. Apparatus as claimed in claim 24 in which the spurious mechanisms include both of the third images.

30. Apparatus as claimed in claim 24 in which the spurious mechanisms include the mixer sum product.

31. Apparatus for determining an appropriate intermediate frequency for a radio frequency transmitter in which a modulated signal at an intermediate frequency is mixed with a local oscillator waveform having a different frequency to yield as one of the mixing products a signal at a desired frequency for transmission, the apparatus comprising:

a) means for receiving input data defining a tuning band of frequencies which the transmitter is desired to transmit;

b) means for receiving input data defining an avoidance band containing radio frequencies closed to external transmission;

c) means for storing data relating to a plurality of spurious mechanisms by which the transmitter transmits spurious signals and determining the relationship between the spurious signals and the intermediate frequency; and

d) means for determining which of the intermediate frequencies result in spurious emissions to the avoidance band for any of the frequencies in the tuning band.

32. Apparatus as claimed in claim 31 in which said means include means for determining, for each spurious mechanism, one or more hazard bands being ranges of frequency of spurious emissions each corresponding to the whole of the tuned band.

33. Apparatus as claimed in claim 24 in which the spurious mechanisms are ranked in said means (c) according to their significance and in which a range of available intermediate frequencies is divided in to sub-ranges each identified by the most significant spurious mechanism, if any, affecting the avoidance band(s) and resulting from the use of an intermediate frequency in that sub-range.

34. Apparatus as claimed in claim 31 in which the spurious mechanisms are ranked in said means (c) according to their significance and in which a range of available intermediate frequencies is divided in to sub-ranges each identified by the most significant spurious mechanism, if any, affecting the avoidance band(s) and resulting from the use of an intermediate frequency in that sub-range.

35. Apparatus as claimed in claim 33 in which said means (c) stores ranking data for the spurious mechanisms.

36. Apparatus as claimed in claim 33 including means for receiving input data relating to the ranking of the spurious mechanisms.

37. Apparatus as claimed in claim 24 in which the spurious mechanisms include the first image.

38. Apparatus as claimed in claim 24 in which the spurious mechanisms include local oscillator leakage.

39. Apparatus as claimed in claim 24 in which the spurious mechanisms include intermediate frequency leakage.

40. Apparatus as claimed in claim 24 in which the spurious mechanisms include the second harmonic of the local oscillator.

41. Apparatus as claimed in claim 24 in which the spurious mechanisms include the third-order reverse inter-modulation product of the local oscillator and any external source of interference in the tuning band.

42. Apparatus as claimed in claim 24 including selection means for selecting a plurality of spurious mechanisms from a larger plurality of spurious mechanisms in said storing means (c) and inputting only said selection to said determining means.

43. Apparatus as claimed in claim 31 in which the spurious mechanisms include the first image.

44. Apparatus as claimed in claim 31 in which the spurious mechanisms include local oscillator leakage.

45. Apparatus as claimed in claim 31 in which the spurious mechanisms include intermediate frequency leakage.

46. Apparatus as claimed in claim 31 in which the spurious mechanisms include the second harmonic of the local oscillator.

47. Apparatus as claimed in claim 31 in which the spurious mechanisms include the third-order reverse inter-modulation product of the local oscillator and any external source of interference in the tuning band.

48. Apparatus as claimed in claim 31 including selection means for selecting a plurality of spurious mechanisms from a larger plurality of spurious mechanisms in said storing means (c) and inputting only said selection to said determining means.

49. A radio frequency receiver having means for receiving modulated r.f. signals, a mixer and a local oscillator, in which said mixer mixes said r.f, signals with signals from said local oscillator to yield as one of the mixing products a signal at a desired intermediate frequency or a range of signals at a range of intermediate frequency for subsequent processing, said receiver further having apparatus according to claim 24

and means for changing the intermediate frequency or intermediate frequency range in response to said determining means to a frequency or range which

minimises spurious responses from or emissions to the avoidance band(s) for the whole of the tuning range.

50. A receiver as claimed in claim 49 having means for receiving transmitted information relating to avoidance bands and supplying said information to said means (b).

51. A receiver as claimed in claim 49 having means storing information relating to avoidance bands and geographical location and means for receiving geographical location information to determine the appropriate avoidance band(s).

52. A receiver as claimed in claim 49 having means for receiving transmitted geographical information.

53. A receiver as claimed in claim 49 in which said determining means comprises a microprocessor.

54. A receiver as claimed in claim 49 in which said means for changing the intermediate frequency or frequency range operates to change the frequency of the local oscillator.

55. A receiver as claimed in claim 49 including band pass filter means for receiving the mixer output and selecting signals at the intermediate frequency or range, in which the pass band of said filter means is variable depending on the intermediate frequency.

56. A receiver as claimed in claim 55 in which the filter means comprises a plurality of band pass filters having different pass bands and switching means connecting a selected one of said band pass filters to the output of the mixer.

57. Apparatus as claimed in claim 49 including tunable filter means for receiving the mixer output and selecting signals at precise intermediate frequency.

58. Apparatus as claimed in claim 57 in which said tunable filter means comprises a plurality of tunable filters having different tuning bands encompassing a contiguous range of intermediate frequencies.

59. A radio frequency transceiver including a receiver as claimed in claim 49 and a transmitter, the transmitter including a mixer having an input connected to a local oscillator for mixing signals for transmission with a local oscillator waveform having a different frequency to yield as one of the mixing products a signal at a desired frequency for transmission, wherein said apparatus for determining an intermediate frequency (i.f.) or i.f. range for the receiver is also operable to determine an i.f. or i.f. range for the transmitter and wherein the transmitter has means for changing the intermediate frequency in response to said determining means to an i.f. or i.f. range which minimises spurious emissions to the avoidance band(s) for the whole of the tuning range.

60. A transceiver as claimed in claim 59 in which the means for changing the transmitter i.f. operates to change the frequency of the transmitter local oscillator frequency.